

How to get dp/p from df/f

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We have

$$\frac{dp}{p} = \gamma^2 \left\{ \frac{df}{f} + \frac{dR}{R} \right\}, \quad \frac{dR}{R} = \frac{1}{\gamma_t^2} \left\{ \frac{dp}{p} - \frac{db}{b} \right\} \quad (1)$$

and, at fixed field,

$$\frac{dR}{R} = \frac{1}{\gamma_t^2} \left\{ \frac{dp}{p} \right\}. \quad (2)$$

Thus

$$\frac{1}{\gamma^2} \frac{dp}{p} = \frac{df}{f} + \frac{dR}{R} = \frac{df}{f} + \frac{1}{\gamma_t^2} \frac{dp}{p} \quad (3)$$

$$\left\{ \frac{1}{\gamma^2} - \frac{1}{\gamma_t^2} \right\} \frac{dp}{p} = \frac{df}{f} \quad (4)$$

$$\left\{ \gamma_t^2 - \gamma^2 \right\} \frac{dp}{p} = \left\{ \gamma_t^2 \gamma^2 \right\} \frac{df}{f} \quad (5)$$

and

$$\frac{dp}{p} = \left\{ \frac{\gamma_t^2 \gamma^2}{\gamma_t^2 - \gamma^2} \right\} \frac{df}{f}. \quad (6)$$

From the measured frequencies we therefore obtain dp/p .